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DoMORE

Phoenix Excavating rises to new heights

20+ DOOSAN ATTACHMENTS
ADD VERSATILITY, REVENUE OPPORTUNITIES

3 NEW MATERIAL HANDLERS

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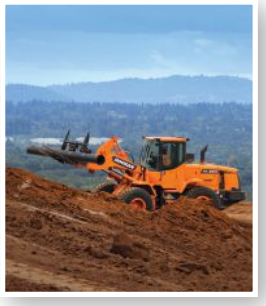
ABOUT THE COVER

A Doosan wheel loader owned by Phoenix Excavating, Vancouver, Washington, was part of a successful infrastructure project where operators used the machine for moving materials and backfilling trenches and roadways with aggregate.



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27% RENEWABLE CONTENT

To find out more about Doosan construction equipment, Stephen Foster, vice president of Titanium Contracting Inc., visited The Real Operation Center (ROC) in Tucson, Arizona.

"Since I was new to the Doosan lineup, I took the opportunity to see how it performed in real-world working situations," he says. "My main operator, who has run excavators for a quarter of a century, went along to give the machines a good test. We came away impressed with the equipment."

The ROC, with 40 acres of working space, gives visitors access to all of the newest Doosan models of crawler excavators, wheel excavators, wheel loaders, articulated dump trucks, log loaders and numerous attachments.

Visit **www.doosanequipment.com/roc** to learn more about The ROC — the ultimate Doosan operating experience.

Scan this code to watch a video titled "Doosan Real Operation Center: What to Expect" to learn more about what you'll find at The ROC.

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CUSTOMER SPOTLIGHT

A Doosan DX300LC SLR (super-long reach) excavator operated by Scott Bridge Company, Opelika, Alabama, places rocks in the Chattahoochee River. The excavator was working at a spot where the river divides Columbus, Georgia, and Phenix City, Alabama. Scott Bridge Company is a customer of Cowin Equipment Company, Inc., a Doosan dealer in the southeast United States.

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TIER 4 EXCAVATORS DEBUT

Two new crawler excavators generate higher torque levels and faster engine response even at low rpm

Doosan is introducing the first two Tier 4-compliant Doosan crawler excavators this spring — the DX300LC-5 and DX350LC-5 — which will be followed by additional excavator models and Tier 4-compliant wheel loaders and articulated dump trucks later this year.

Tier 4 is the fifth set of emission standards adopted and regulated by the U.S. Environmental Protection Agency (EPA) for new non-road diesel engines. To meet strict Tier 4 emission standards, we took a systems-based clean diesel approach: internal engine modifications and after-treatment technologies. Additionally, diesel fuel advancements by oil refineries help reach Tier 4 compliance.

Internal engine modifications

We utilize diesel engines in our excavators, which include a high-pressure common rail (HPCR) system and cooled exhaust gas recirculation (CEGR). The latter varies the amount of exhaust gas recirculated back to the combustion chamber. The combustion temperature is therefore optimized to balance the reduction of particulate matter (PM) and the formation of nitrogen oxides (NO_x). Benefits of the engine modifications include:

- A variable geometry turbocharger (VGT) is utilized to optimize boost pressure throughout a wide rpm range of the engine, resulting in improved fuel efficiency at lower rpms
- This also generates higher torque levels and faster engine response even at low rpm

For Tier 4 emission standards, we added a mass airflow sensor and exhaust brake. The mass airflow sensor allows the electronic control unit (ECU) to improve the management of airflow from the VGT, and optimize the fuel delivery to the combustion chamber based on air intake volume and rpm.

- The exhaust brake helps to maintain consistent engine temperatures at lower engine speeds to improve operating efficiency
- Consistent engine temperatures reduce harmful emission levels in the exhaust when the engine is running at lower rpms
- Under normal operation, with high rpms, the exhaust brake is inactive

After-treatment technologies

Tier 4-compliant Doosan excavators will combine selective catalyst reduction (SCR) with a diesel oxidation catalyst (DOC) to reduce engine emission levels. Diesel exhaust fluid (DEF) is used with SCR technology and stored in a DEF tank near the front-left corner (opposite of the operator station) of the Doosan crawler excavators. The DOC works in conjunction with SCR to transform PM emissions into harmless water and carbon dioxide. DEF is injected into the exhaust system to help the NO_x produced during combustion transform into water and nitrogen.

Advancements to diesel fuel

Working in tandem with engine modifications and after-treatment technologies, the third part of meeting Tier 4 emission standards is diesel fuel quality. Ultra-low-sulfur diesel fuel, available in grades 1-D and 2-D with sulfur levels of 15 ppm, helps to maximize the Doosan excavator's engine performance.

FEATURES AT A GLANCE

NEW: DOOSAN TIER 4 CRAWLER EXCAVATORS

DX300LC-5

HORSEPOWER, GROSS: 271 HP (202 KW)
OPERATING WEIGHT: 68,764 LB. (31,191 KG)
MAX. DIGGING DEPTH: 23 FT. 11 IN. (7,3 M)
MAX. DIGGING REACH (GROUND): 34 FT. 7 IN. (10,5 M)
MAX. LOADING HEIGHT: 23 FT. 10 IN. (7,3 M)
SWING TORQUE: 87,751 LBF.-FT. (12,137 KGF-M)
ARM DIGGING FORCE: 30,644 LBF. (13,900 KGF)
BUCKET DIGGING FORCE: 44,092 LBF. (20,000 KGF)
DRAWBAR PULL: 77,162 LBF. (35,000 KGF)
MAX. AUXILIARY HYDRAULIC FLOW: 2 X 65.5 GPM (2 X 248 L/MIN.)
FOUR POWER MODES ARE AVAILABLE
FOUR WORK MODES ARE AVAILABLE

DX350LC-5

HORSEPOWER, GROSS: 318 HP (237 KW)
OPERATING WEIGHT: 80,654 LB. (36,584 KG)
MAX. DIGGING DEPTH: 24 FT. 8 IN. (7,5 M)
MAX. DIGGING REACH (GROUND): 36 FT. (10,9 M)
MAX. LOADING HEIGHT: 23 FT. 6 IN. (7,2 M)
SWING TORQUE: 112,907 LBF.-FT. (15,610 KGF-M)
ARM DIGGING FORCE: 41,667 LBF. (13,900 KGF)
BUCKET DIGGING FORCE: 57,100 LBF. (25,900 KGF)
DRAWBAR PULL: 83,335 LBF. (37,800 KGF)
MAX. AUXILIARY HYDRAULIC FLOW: 2 X 92.5 GPM (2 X 350 L/MIN.)
FOUR POWER MODES ARE AVAILABLE
FOUR WORK MODES ARE AVAILABLE

Options

Factory-installed options for the new Doosan DX300LC-5 and DX350LC-5 include:

- Two-way auxiliary hydraulic pedal
- Diesel-powered coolant heater for cold starts
- Straight travel
- Additional work lamps
- Cab guarding for special applications
- Rotate circuit piping

Operators can choose between the floor pedal control of auxiliary hydraulics or on the excavator's joystick control. For greater operator comfort, the floor pedal angle has been improved by 10 degrees.

Excavator updates

The newest Doosan crawler excavators received some valuable updates to coincide with the Tier 4 launch. They include the following:

- Auto shutdown
- LCD display panel update
- Improved serviceability
- Auto belt tensioner: fan and air conditioning
- Anti-skid plates
- Emergency engine stop was relocated for easier access
- Battery upgrades
- New 100-amp alternator

Fuel savings

Auto shutdown helps owners save fuel during non-working conditions. When enabled, the feature will shut down the excavator's engine after a preset idle time. For example, the operator can configure the idle time from 3 to 60 minutes. For operators in California, auto shutdown helps meet the state's regulations of idling for only 5 minutes for off-highway machines.

Display enhancements

An improved 7-inch LCD display panel allows operators to continue monitoring the excavator parameters while viewing the rearview camera image. Critical machine data appears next to the camera view (see picture left). With optional side cameras, a split screen allows both camera displays to be viewed at once. New additions to the monitor include the DEF gauge and fuel efficiency.

Contact your local Doosan dealer for more information about these new models. Look for more information about Tier 4 Doosan products, including wheel loaders and articulated dump trucks, in future editions of DoMORE® magazine. DM

For many more details about technologies utilized for interim Tier 4 and Tier 4 Doosan machines, visit doosanequipment.com/Tier4. From there you can click on "Technology Strategy" to learn more about our approach to meeting Tier 4 emission standards.

THREE HARD-HITTING MACHINES TURN WASTE INTO PROFITS

New Doosan material handlers are designed for heavy lifting in solid waste and recycling industries

Doosan has introduced three new material handlers and four-tine grapples to further increase its presence in the solid waste and recycling industries.

The first model being launched in North America is the DX225MH-3 material handler. Additional material handlers will include a larger model with steel tracks, the DX300MH-5, and a wheel model, the DX210WMH.

For the first time, Doosan is building machines specifically for material sorting and handling applications. Previously, dealers converted Doosan crawler excavators or wheel excavators into material handling machines.

Built for demanding applications

Doosan material handlers were developed to meet the demands of material handling professionals by dedicated in-house product engineering support. Each material handler is based on a proven and tested excavator model, factory-fitted with the following:

Cab risers: increase visibility to work area
Straight boom: improves reach and lift height for better material placement
Droop nose arm: delivers good grapple clearance and enhanced access into containers
Machine guarding: offers uptime protection
Dual-boom cylinders: provide excellent lifting capabilities

Doosan material handlers were developed to meet the demands of material handling professionals by dedicated in-house product engineering support.

Risers = visibility

From the elevated cab, operators have good visibility to the attachment and work areas that are unique to the material handling industry. Standard fixed cab risers for the DX225MH-3 are 4 feet tall, and 6 feet tall for the larger DX300MH-5. Available as a factory-installed option on the DX225MH-3 is a 6-foot-tall fixed cab riser. Fixed risers can easily be lowered for transport with a self-contained, electronically powered hydraulic system.

Available as an option for the DX225MH-3 and DX300MH-5 is a 6.5-foot-tall hydraulic cab riser. The 6.5-foot hydraulic cab riser is standard equipment for the DX210WMH. A hydraulic cab riser allows the operator to efficiently raise and lower the cab as needed for increased visibility when loading trucks or railcars.

Grab and go

To maximize their versatility and productivity, Doosan material handlers can be paired with a grapple for material handling applications. A 5/8-cubic-yard grapple is approved for use with the DX210WMH and the DX225MH-3, while a 1-cubic-yard grapple is approved for use with the DX300MH-5. The hydraulic four-tine grapples rotate 360 degrees and feature a semi-closed tine design, allowing a firm grasp on most materials. The tines are designed with AR400 high-strength, abrasion-resistant steel for increased durability, and the tine tips are replaceable for easier maintenance.

Operating modes

Four power modes are available for the Doosan DX225MH-3 and DX300MH-5 material handlers: Power+ mode, Power mode, Standard Power mode and Economy mode.

Doosan telematics

Closely monitor your heavy equipment with telematics. Telematics is standard for Doosan material handlers, and will come with a three-year subscription. See your dealer for more details.

FEATURES AT A GLANCE

DX210WMH

TIER 3 EMISSION COMPLIANT
HORSEPOWER (GROSS): 170 HP
OPERATING WEIGHT: 58,202 LB.
SWING TORQUE: 60,786 LBF.-FT.
DRAWBAR PULL: 26,742 LBF.
MAX. LOADING REACH: 35 FT. 9 IN.
MAX. LOADING HEIGHT: 39 FT. 8 IN.
MAX. AUXILIARY HYDRAULIC FLOW: 2 X 61 GPM

DX225MH-3

INTERIM TIER 4 (iT4) EMISSION COMPLIANT
HORSEPOWER (GROSS): 166 HP
OPERATING WEIGHT: 60,848 LB.
SWING TORQUE: 60,757 LBF.-FT.
DRAWBAR PULL: 60,715 LBF.
MAX. LOADING REACH: 35 FT. 5 IN.
MAX. LOADING HEIGHT: 40 FT.
MAX. AUXILIARY HYDRAULIC FLOW: 2 X 55 GPM

DX300MH-5

TIER 4 EMISSION COMPLIANT
HORSEPOWER (GROSS): 271 HP
OPERATING WEIGHT: 79,366 LB.
SWING TORQUE: 87,787 LBF.-FT.
DRAWBAR PULL: 83,258 LBF.
MAX. LOADING REACH: 42 FT. 8 IN.
MAX. LOADING HEIGHT: 46 FT. 3 IN.
MAX. AUXILIARY HYDRAULIC FLOW: 2 X 66 GPM

Additionally, the DX225MH-3 and DX300MH-5 material handlers have a Lifting work mode. The Lifting mode is ideal for Doosan material handlers because it provides increased pump torque, low engine rpm and an automatic power boost.

The DX210WMH is available with three selectable power modes: Power, Standard Power and Economy. DM

Material handlers will be available this summer. Contact your dealer for more information.

Customize a material handler

Factory-installed options for Doosan material handlers vary by model. Options include the following:

ALL MODELS

- Additional work lamps
- Cab guarding for special applications
- Frame guards
- Rotating beacon

DX210WMH

- Solid tires

DX225MH-3 and DX300MH-5

- Air compressor
- Catwalk
- Diesel-powered coolant heater
- Straight travel

DOING THE HEAVY LIFTING (and digging)

Doosan machines excavate and handle materials to help build a new innovation facility

Two heavy-duty Doosan machines were critical to the construction of a new Doosan Infracore Construction Equipment America innovation, testing and technology facility in Bismarck, North Dakota, called the Acceleration Center, which is scheduled to open this summer.

Rich Goldsbury, Doosan president, North America and Oceania, was the master of ceremonies in May 2013 for a groundbreaking event at the site of the Acceleration Center, to kick off the construction project. What better way to help ensure that the earth work portion of the project was done efficiently than to use two of the best high-production Doosan machines — a DL350-3 wheel loader and a DX350LC-3 crawler excavator (pictured below) — for excavating, grading, material handling and backfilling?

Laying the ground work

Comstock Construction Inc., Wahpeton, North Dakota, is the general contractor for the Acceleration Center with all site excavation being completed by Veit & Company, Inc. (Veit), an 85-year-old, third-generation business. In the Engineering News Record list of top excavation/foundation contractors, Veit is ranked as the 6th largest.

"We started grading the site in spring and continued working through fall," says Mike Cook, Veit project manager. "We did the prep work for the new building and for the areas to be paved, installed utilities and built a pond for storm water drainage."

When the project began, the only structure on site was a 100,000-square-foot building that had been used primarily as an inventory sequencing center. Veit removed all of the concrete and gravel on the north side of that facility and then excavated a 120-foot by 270-foot rectangle for the arena. They dug down 16 feet and filled it with class 5 gravel right up to the walls of the building.

> *"The DX350LC is a smooth, well-designed excavator that's very fuel-efficient. Fuel usage was about 20 percent less than a comparable-size competitive machine."*
>
> — **Rob Featherson,** Veit & Company, Inc.

Doosan heavy hitters

The Doosan DL350-3 is a 43,762-pound wheel loader that lifts higher than other loaders, with an industry-leading dump height of 10 feet (3 meters). The 271-horsepower engine delivers impressive power and outstanding torque along with longer component life and reduced operating costs. The DX350LC-3 is a 78,601-pound Doosan crawler excavator that consistently produces superior results while keeping fuel expenses low. With a digging depth of 24 feet, 9 inches (7,5 meters) and rapid cycle times, the machine is a high-production model that gets the job done.

"That will allow us to bring equipment into the arena for testing and digging," says Matt Sagaser, director of the North American Acceleration Center for Doosan Infracore Construction Equipment. "With no clay, rocks or topsoil, we will have a repeatable, consistent material for evaluating the performance of our machines and attachments."

On one side of the arena is a two-story demonstration deck enclosed in glass. With grandstand seating on each level, visitors will be able to view what is going on in the arena.

Another important feature of the Acceleration Center is a 22-acre outdoor testing area. Different types of material — crushed concrete, metal, rock, gravel and clay — will be brought in to duplicate customer jobsites. This will enable the company to test attachments in a real work environment.

High marks

Among the heavy equipment Veit used on the job were a Doosan DL350-3 wheel loader and a DX350LC-3 crawler excavator. Although the Doosan brand was new to Veit, the wheel loader and excavator made a positive impact on site managers and operators alike. "I really had no opinion about Doosan equipment before I started using these two machines," says Rob Featherson, project superintendent. "I liked what they did and would definitely use them again."

The DL350-3 with a pallet fork attachment hauled pipe and moved material around the jobsite with a bucket. "It's a real nice machine, very responsive and packs plenty of power," he says.

The DX350LC-3 was kept busy digging footings, building the pond and installing utilities. "The DX350LC is a smooth, well-designed excavator that's very fuel-efficient," Featherson says. "Fuel usage was about 20 percent less than a comparable-size competitive machine. The Doosan excavator did a good job for us."

Featherson gives both machines high marks for having roomy, comfortable operating cabs with good all-around visibility, and for being "loaded with good technology."

"The operators seemed pleased, and we were able to use the machines on other projects when they were not needed at the Acceleration Center," Cook says.

Dick Travis, Veit regional manager, noticed the Doosan products were popular among the different crews. "Those machines were constantly running all over to our other jobs in the area," Travis says. "I know that at another local jobsite, we had one of our own wheel loaders, but the operators elected to use the Doosan model instead." DM

Visit **www.doosanequipment.com** to learn more about Doosan excavators and wheel loaders.

ABOUT THE CENTER

Developing the next generation of Bobcat® equipment will be on the fast track when a new innovation, testing and technology facility is complete on the North Dakota prairie.

The Acceleration Center, built in Bismarck, North Dakota, is where the newest compact equipment designs, latest technologies and best ways to apply important product features will become the daily focus of a team of highly skilled professionals.

PROJECT HIGHLIGHTS INCLUDE:

Expanding an existing structure that will include a two-story office building and provide a total of 160,000 square feet of modern workspace

Constructing a 35,000-square-foot indoor testing arena

Installing a 22-acre outdoor testing and track area

The Acceleration Center will be initially staffed by 155 employees, all dedicated to innovating and advancing designs, testing, prototype engineering and computer simulation of ideas and concepts — efforts to move forward quickly with the goal of bringing products to market sooner. An open-space and high-tech design will encourage collaboration and innovative discussion among engineering, manufacturing, sales and customer teams.

TWO DOZEN DOOSAN ATTACHMENTS

Expand versatility and reduce overall operating costs

Expanding a Doosan crawler or wheel excavator or wheel loader's versatility is a cost-efficient alternative to operating dedicated machines on a jobsite. Attachments help Doosan equipment owners grow business, replace less effective machines, lower operating costs and significantly increase a machine's flexibility.

Attachment versatility for Doosan equipment can stretch your fleet resources with their ability to adjust to changing applications, and serve as work tools to perform multiple jobs. Both wheel loaders and excavators can be used with different attachments — more than two dozen types and models — that can help increase revenue and keep machines working year-round.

Doosan attachments, which are built and configured for use with Doosan heavy equipment for durability and reliability, also offer a low initial investment with a high rate of return. When budgets are tight, it's typically easier and more cost-effective to rent or purchase attachments to complete a special job or offer a niche service than to purchase a separate machine. Contact your local Doosan dealer to inquire about its attachment inventory when special projects or applications arise.

"With the right selection of genuine Doosan attachments, a contractor may only need to bring one excavator or one wheel loader to a jobsite," says John Sad, Doosan heavy attachments product manager.

Excavator attachments

Doosan crawler and wheel excavators are ideal candidates for attachment integration, which can help owner-operators build a custom fit to complete projects far beyond just earthmoving. Attachment connection systems and auxiliary hydraulic flow allow many sizes of excavators to be extremely effective tool carriers for a wide variety of attachments. Those attachments include:

- Buckets
- Clamps
- Crushers
- Grapples
- Hydraulic breakers*
- Hydraulic pin-grabber quick couplers
- Plate compactors
- Rippers
- Wedge-lock couplers

**Tools such as a moil, chisel, blunt and pyramidal are available for use with Doosan hydraulic breakers.*

Doosan attachments, which are built and configured for use with Doosan heavy equipment for durability and reliability, also offer a low initial investment with a high rate of return.

MULTI-PURPOSE BUCKET

Shane Reardon, Doosan excavator product specialist, also dispels the notion that excavators become less versatile as their sizes increase. This industry misperception has occurred because machines have typically been dedicated to do a single job with one attachment. "Even the larger excavators can be more versatile if you put different attachments on them," he says.

Wheel loader attachments

While attachment options for Doosan wheel loaders and excavators are typically not compatible due to different attachment change mechanisms, loader-specific attachments have turned these heavy-duty machines into valuable assets for every season. The most popular Doosan attachments for wheel loaders range from light-material, general or all-purpose material-handling buckets to heavy, rock or grading buckets.

- General purpose buckets
- Pallet forks
- Grapples
- Light-material buckets
- Snow pushers
- Multi-purpose buckets
- Hydraulic quick couplers
- Rock buckets

"With several different types of buckets and specialty attachments available, the loaders' capabilities can be maximized to serve a wide variety of applications year-round," says Mike Stark, Doosan wheel loader product specialist.

Multi-function machines

If you've ever owned compact equipment, you know the key to achieving a favorable return on investment is to reach high machine utilization. Leveraging attachments to perform certain tasks can significantly increase those rates. The same is true for Doosan heavy equipment. A multi-function machine that is productive on a daily basis not only has a greater chance of generating profit, but also can be more responsive to your needs on a jobsite.

For example, you may have a dedicated excavator only used for trenching or ditching, and if so, you may be missing an opportunity (or more).

Fit your excavator with attachments such as a grapple for land clearing, a trenching bucket to dig foundation footings or a plate compactor to finish trenches.

"There are some contractors with a mindset that they'll bring in a piece of heavy equipment for site preparation and then assign a smaller piece of equipment for other tasks," Sad says. "Having machines sit idle while you bring in different equipment isn't the most efficient way to work. By utilizing attachments, operators can do more with fewer machines."

Maneuverability on most confined worksites can still be achieved with excavators as large as 50,000 pounds and wheel loaders up to 40,000 pounds. The ideal end goal, Sad says, is to make the power unit as versatile as possible and on as many different jobsites as possible.

The key to getting the most productivity from an excavator or a wheel loader is the investment in a quality attachment change system, which is optional on most manufacturers' machines. Some industry experts estimate that a quality automated coupler mount on an excavator can save owners up to 25 percent of their total machine operating time compared to direct-mount attachments.

According to Reardon, a quick coupler installed on the end of an excavator arm speeds up efficiency. "It allows the operator to change an attachment on a machine in a fraction of the time compared to manually using pins to connect the attachment to the excavator," Reardon says.

Many of the efficiencies are gained from operators being able to rapidly change attachments with a quick coupler from the comfort of a cab. **DM**

Visit **www.doosanequipment.com** and click on the attachments link on the homepage for a complete list of Doosan attachments.

WHY A NEW START-UP CHOSE DOOSAN EQUIPMENT

How reliable and productive Doosan excavators fuel company's success

To dramatically exceed expectations in its first year, Titanium Contracting Inc. had to pull together all the necessary building blocks to launch a construction company: identify potential jobs, win bids, work efficiently, and have skilled employees and productive equipment. And, as it turns out, taking a different approach to some aspects of the business wasn't such a bad idea either.

"As a firm that focuses on municipal services work, we like to handle jobs that are a bit outside of the realm of what a lot of other contractors are comfortable doing," says Stephen Foster (pictured left), vice president of the Toronto company. "Specialization helped us almost triple the first-year goal we set for ourselves."

Busy first year

Titanium Contracting completed a variety of projects during its first year in business. Among them:

1. Demolished multiple structures during winter while protecting wells and utilities. Moved 200,000 liters of groundwater for off-site disposal.

2. Relocated 200,000 cubic meters of clean soil and brought in new soil during construction of new runways at an airport. Followed stringent regulations of government agencies.

3. Built sound barrier fence at bus terminal, then installed landscaping at the site while carefully implementing a traffic management plan.

4. Installed 1 kilometer of noise barrier fencing along a regional road in Waterloo, Ontario. Due to grade constraints, the wall included the installation of a 1.5-meter high retaining wall.

5. Reduced phosphorus level in lake that was affected by significant algae growth.

Water experts

Titanium Contracting sets itself apart by its ability to work at water-related sites. "It's the type of project that other firms tend to avoid," says Foster, who has an affinity for working with water from his training as a hydrogeologist. "On jobs, such as building roads, you can control most variables. You add water, everything changes. There's more risk. Is it a controllable risk? I like to think so. But maybe others don't.

"In our short history, we've become very good at dealing with situations where construction takes place in and around water. That niche has helped boost our reputation and allowed us to generate additional revenue."

Choosing best equipment

As a new company with plans to bid on a variety of jobs — including some that were fairly complicated — Titanium Contracting decided early on to look for reliable and productive equipment. That search took them to Top Lift Enterprises, the Doosan dealer in Stoney Creek, Ontario.

A visit to their Doosan dealer and to the Doosan Real Operation Center helped the company decide to purchase two crawler excavators — a DX420LC-3 and a DX235LCR. Both were productive contributors to Titanium Contracting's success. Foster explains:

"The DX420LC-3 — even with added accessories such as a mechanical thumb, FOPS, quick coupler and auxiliary hydraulics — is the perfect size for transporting," he says. "Our goal is to avoid paying for overweight permits. As we travel throughout Ontario, we would have had to get five to 10 different permits. It would have been a nightmare. A $3,300 move could turn into a $7,000 move. Along with being the right size for transporting, the DX420LC-3 has the power and precise controls that allow us to lift and place a 12-ton culvert, which is one of the most common jobs we do. Overall, it's a great machine.

Proper service with genuine Doosan parts

With equipment constantly going to jobs far away from its Toronto headquarters, Stephen Foster of Titanium Contracting Inc. makes certain that all of the machines are in tip-top shape when they depart.

"That's why I'm very particular about having the equipment properly serviced at the appropriate times," he says. "For our Doosan excavators, I rely on our dealer (Top Lift Enterprises) to provide all genuine Doosan parts. The professionals at the dealership know what's best for the machines. I have no interest in using third-party parts."

> ***"The DX235LCR, with its near-zero reduced tail swing, works well in many applications, especially when space is limited."***
>
> **— Stephen Foster,** vice president, Titanium Contracting Inc.

"The DX235LCR, with its near-zero reduced tail swing, works well in many applications, especially when space is limited. At road construction sites, where traffic congestion is often an issue, the machine enables us to either sit in one lane or on the shoulder without significantly impacting traffic. We no longer have to close two lanes when working. It's also great for installing noise barrier fences."

Both excavators rate excellent on fuel efficiency. "I've been surprised at the differences between brands," Foster says. "We closely track fuel usage and, for a fact, the Doosan machines do quite well."

Foster believes that when purchasing equipment, it's important to find out what the operators like. "I've found that when guys are given a machine that they like, they want to take better care of it. Otherwise it tends to age prematurely. With the popularity of the Doosan excavators among our operators, I expect the machines to age slowly." DM

Visit **www.doosanequipment.com** and click on crawler excavators to find more details, including product specifications and approved attachments.

THE RISE OF PHOENIX EXCAVATING

Doosan equipment fuels Pacific Northwest company's post-recession resurgence

As the recession began to swallow Scott's Excavating in 2009, Teri Reisch and Aaron Riley helped their employer with the painful closing of his lifelong business. Along with a soft construction market, their bank had just failed and the FDIC auctioned its loans. Reisch, however, remained optimistic about their leverage. Half of the $10 million fleet was already paid off, and she'd developed a sound strategic plan to negotiate with the new financial institution. That hope went up in flames upon meeting its owner.

A stern hedge fund representative thumbed his plan across the table to Reisch and didn't mince words. It could be done the hard way, he said, or the easy way. He was there to liquidate assets and didn't waste any time.

Reisch and Riley cooperated by day and planned by night. With a combined 40 years of construction experience — Reisch in finance, banking and bonding; Riley in field operations, equipment and estimating — their skill sets were a solid match. Together, they had the potential to form a business partnership that would provide smarter and leaner solutions with a more balanced, long-term financial approach.

Phoenix rises

Phoenix Excavating , Vancouver, Washington, rose from the ashes in 2010 determined to embody its namesake. The company has grown to 30 employees and revenues doubled from 2012 to 2013. With steadily improving markets and work volume, the underground utility contractor partnered with Portland-based Feenaughty Machinery to rebuild the company with a fleet investment that includes five Doosan excavators — a DX140LC-3, two DX225LC-3 machines and two DX255LC-3 models — and a rented Doosan DL250-3 wheel loader.

"When we evaluated potential rental costs for the excavators, it made more sense to purchase," Reisch says. "Production is key and downtime is not acceptable. Having new machines and a dealer and manufacturer who are willing to stand behind us with an extended warranty is important."

With a full fleet, Phoenix Excavating started accelerating its plan to function as a general contractor or a site work subcontractor and any mix in between to deliver excavating, utility installation, road planning and construction services. Doosan machines are helping the progressive firm carve out a strong market position with commercial, residential, industrial and governmental developers in southwest Washington's Clark and eastern Washington's Franklin and Benton counties.

Residential market returns

Like many housing markets, homebuilding came to a virtual halt in Clark County during the economic slowdown, and developers today are working fast to alleviate inventory demand for the growing market outside Portland, Oregon. Through August 2013, the U.S. Census Bureau was reporting a significant rise in housing construction permits in the area with both single-family and multi-family dwelling starts compared to 2012.

"Bank financing is still pretty difficult with the additional regulations in place, but many projects have started up because it now pencils even with the cost to have an outside investor finance projects," Reisch says.

High in the hills overlooking the city of Camas and the Columbia River, Phoenix Excavating is helping to expand housing availability by preparing the infrastructure on a 34-lot subdivision for Lennar Homes, one of the nation's largest homebuilders. A typical production cycle for Riley and his crews, Phoenix Excavating constructed 7,800 square feet of retaining walls, installed the dry utilities, supervised the storm, sewer and water placements, and rocked the roads before the rainy season set in around the middle of October.

A DX225LC-3 (pictured at top) and DX255LC-3 worked in tandem with a variety of scrapers to remove 37,000 cubic yards of dirt to pare the land down to lots ranging from 8,000 to 20,000 square feet. In addition to the aggressive schedule, Phoenix Excavating crews were tasked with a 15-acre site that sits in a bed of clay on top of a foundation of camas basalt — a high-psi rock native to the Columbia River region.

Equipped with a 24-inch bucket, the DX255LC-3 was responsible for digging trenches for the catch basins and the placement of storm water and utility pipes. Riley operated the 167-horsepower

Teri Reisch (left) and Aaron Riley leveraged their expertise to help Phoenix Excavating grow, both in terms of employees and revenue, since the company began in 2010.

DX225LC-3 excavator outfitted with a 60-inch bucket to carve out a wall up to 14 feet high from the bank that runs along the east property line. Designed with a maximum digging height of 31 feet 4 inches, the DX225LC-3 supplied the vertical and horizontal reach Riley needed to peel away layers of soil and contour the first of six retaining walls on the project.

The DX225LC-3's two variable displacement axial piston pumps produce faster cycle times and provide Riley with additional power to efficiently manage the clay and basalt mix. "You have to have good hydraulics to dig in this ground," Riley says.

The Doosan 172-horsepower DL250-3 loader, with its bucket and fork attachments, assisted crews with utility pipe staging and finishing tasks such as backfilling trenches and roadways with aggregate. Meanwhile, Doosan excavators worked simultaneously on the company's other residential projects, including a 34-lot subdivision in Ridgefield, Washington, and an apartment complex in nearby Vancouver, Oregon.

Reducing cost of ownership

A young company with astute financial oversight, Reisch and Riley continually focus on increasing uptime and reducing their cost of ownership. In order for their equipment to effectively pencil out,

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> *At $4 a gallon for diesel, a one-gallon-per-hour savings makes a huge difference. If we have 20 machines out working for 10 hours a day, that's 200 gallons of fuel we can save. That one gallon per hour in fuel across our fleet equates to about $800 a day, or $210,000 a year.*
>
> — **Aaron Riley,** Phoenix Excavating

Reisch says it needs to provide key fiscal advantages through price, fuel consumption and maintenance.

Fuel consumption is one of the biggest input costs for the operation, and one that can be impacted with more economical equipment designs. The Doosan excavators' efficient horsepower curve delivers increased torque using less fuel. The high-pressure common rail fuel injection system helps reduce emissions and allows the interim Tier 4-compliant engine to have a 6 percent improvement in efficiency compared to previous Tier 3 models.

"At $4 a gallon for diesel, a one-gallon-per-hour savings makes a huge difference. If we have 20 machines out working for 10 hours a day, that's 200 gallons of fuel we can save," Riley says. "That one gallon per hour in fuel across our fleet equates to about $800 a day, or $210,000 a year. Industrywide, Doosan competes with everybody on fuel efficiency."

Riley also values the aftermarket auto greaser,* which helps him simplify and control daily maintenance. "Everything we can do to take human error out of the equation is a win. The auto greaser saves time and energy. You're actually using less grease and you're not paying your guys at the end of the day to do it. And, you're not getting as much wear and tear on the machine because it's being greased on a set schedule," Riley says.

The owners both say the ability to create revenues with an asset that requires a smaller initial investment and at a lower cost per hour will help keep Phoenix Excavating in business longer during good times and lean times.

"Our thought process is you can have more machines and create more revenue at a lower cost this way, as long as the machines are capable of performing the workload," Reisch says.

Riley agrees: "And you need the backing of the dealership that can get issues taken care of in a timely fashion, or get you a replacement machine, to keep you going."

Engaged, balanced and growing

Going forward, Reisch and Riley believe Phoenix Excavating's survival hinges on engaged ownership, relevant growth and a balance of resources. Reisch points out that the company already operates smarter and is more risk-averse than it was in its previous life.

"We have two banks, clients in several industry types and we're not tied into one brand for all of our equipment, but Doosan is where we have our excavators. It's all about balance," she says.

Riley echoes that entrepreneurial team spirit. "If you're not growing, you're dying. If we can see an opportunity coming, we want to be in a position to discuss it. And, if we agree, make it happen." **DM**

Visit **www.doosanequipment.com** to find a complete list of Doosan crawler excavators, performance characteristics, comfort features and approved attachments.

**Doosan does not offer an auto greaser as a factory installed option for its excavators.*

WHO IS DOOSAN?

Doosan is the fifth largest construction equipment manufacturer in the world with a heritage that goes back more than 115 years. We deliver solid machines, unsurpassed customer service and an expanding dealer network.

To see Doosan equipment online, visit **DoosanEquipment.com/AboutDoosan** or scan the code.

Doosan Delivers

DoosanEquipment.com/AboutDoosan 1.877.613.7970

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LOG AND LOAD

Fourth-generation logging family rebuilds and lowers operating costs with Doosan technology

The Olstedts operated the Doosan DX225LL log loader to lift and move felled trees.

Eighty years after the historic Tillamook Burn swept through the northwest Oregon coast range, destroying 13 billion board feet of timber, Olstedt Logging started its morning thinning a mix of alders, fir, hemlock and cedar near Jewell, Oregon. The trees had grown on the same hills that were once scorched in the blaze sparked from a logging operation 40 miles to the east at the North Fork of Gales Creek. Reigniting every six years until 1951, the massive fire eventually consumed 355,000 acres in its path.

Members of the Olstedt family include Dan Olstedt (left), Roric Olstedt (center), and Herb Olstedt. Together, they operated a pair of Doosan log loaders and attachments to efficiently clear a property.

Four generations of logging

Ironically, this soggy morning was not unlike the early fall days of 1933. The annual September rains that finally extinguished the first of the catastrophic forest fires had arrived again, soaking the forests. Around a busy schedule of commercial projects, Herb Olstedt's crews were assisting his nephew, Roric, with clearing and shovel logging one million board feet of wood — all first- and second-growth trees from the original Tillamook Burn fire — on 80 acres of a 225-acre parcel of Roric's personal property.

This fourth-generation logging family knows the meaning of survival, and lending a hand to one another in times of need remains a strong part of the Olstedt DNA. Teaming up to help with that effort were Doosan DX300LL-3 and DX225LL log loaders. Piles of felled trees awaited the company's automated log processor, but recent rains made the dirt roads impassable for the machines. Roric operated the 213-horsepower DX300LL-3 to swing tree bunches to various landing sites where even retired family members helped process them by hand with chainsaws. The logs were being cut into lengths of 8- and 10-foot multiples to meet the loading specifications of Cascade Hardwood, a sawmill in Chehalis, Washington.

Processing the old-fashioned way would stretch their 15 loads from a single day to an entire week.

Herb continued the selective thinning using the 155-horsepower DX225LL, and cleared a stand of trees on an adjacent hill. In a mountainous region marked with steep sloping terrain, the mature trunks ranged from 12 to 14 inches in diameter, with heights up to 40 feet tall. To be productive in these challenging conditions, the Olstedts looked for key features and performance, focusing on swing torque, reach and stability on grades.

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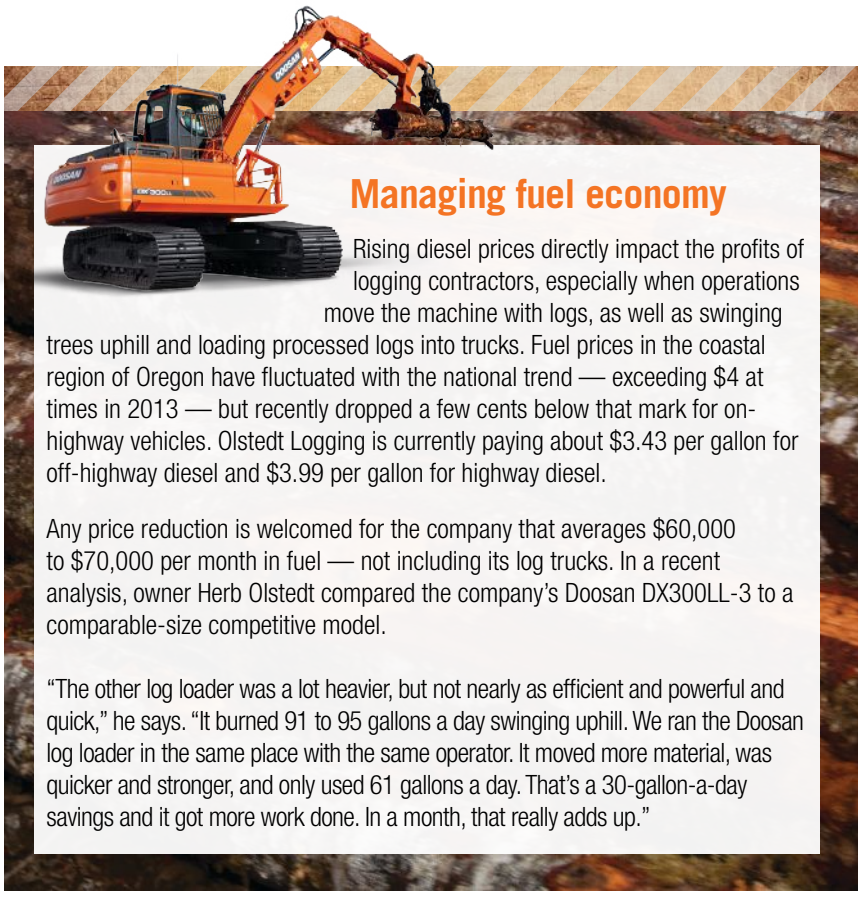

Managing fuel economy

Rising diesel prices directly impact the profits of logging contractors, especially when operations move the machine with logs, as well as swinging trees uphill and loading processed logs into trucks. Fuel prices in the coastal region of Oregon have fluctuated with the national trend — exceeding $4 at times in 2013 — but recently dropped a few cents below that mark for on-highway vehicles. Olstedt Logging is currently paying about $3.43 per gallon for off-highway diesel and $3.99 per gallon for highway diesel.

Any price reduction is welcomed for the company that averages $60,000 to $70,000 per month in fuel — not including its log trucks. In a recent analysis, owner Herb Olstedt compared the company's Doosan DX300LL-3 to a comparable-size competitive model.

"The other log loader was a lot heavier, but not nearly as efficient and powerful and quick," he says. "It burned 91 to 95 gallons a day swinging uphill. We ran the Doosan log loader in the same place with the same operator. It moved more material, was quicker and stronger, and only used 61 gallons a day. That's a 30-gallon-a-day savings and it got more work done. In a month, that really adds up."

"Nothing here is really flat, so you've got to make sure you've got firm footing, and the DX300LL-3 has excellent stability," Roric says. "The swing torque is good too, and with this 38-foot boom, I can swing two large or three medium-size trees uphill."

Operations Manager Dan Olstedt agrees. "That's 100 percent operator confidence to be sitting flat-footed on a hillside and not rocking back and forth and not having to stop all hydraulic movement just to settle the machine down. When it's productive, your guys feel good about it."

Doosan leads a recession rebound

Like many forestry contractors, the recession was extremely difficult. Olstedt Logging was not immune from the effects, but it never closed its doors. Nearly every piece of equipment the company owned was parked for several months and a few employees were dismissed. Today's logging market is much more competitive, and although there are still challenges in the marketplace, there are also signs of recovery. Olstedt Logging's workload has picked up from key customers such as the Oregon Department of Forestry and Weyerhaeuser. Demand has steadily increased from sawmills, wood yards and a flattened pulp mill market.

"Looking back, some of my proudest moments are being able to stay together in the family business over the last few years," Dan says. "It was a rough time and there were a lot of hard calls to make. Being able to keep our employees is super important. We've got a lot of guys who are ground workers, and it's a tough way to make a living, but they do a great job."

Olstedt Logging has grown to 30 employees, and the business has been sustainable enough for Herb and Barbara Olstedt to raise four sons — three of which now work in the family business that specializes in cable-logging and shovel-logging operations and trucking its loads to mills and other processing customers. One of Dan's responsibilities is rebuilding the company's aging log loader fleet that is tasked with selectively thinning, cutting and loading trees in rugged environments for 10 or 11 hours a day. Loading is equally demanding since an average logging truckload holds 4,500 board feet per load and weighs as much as 26 metric tons.

The Doosan log loaders are fulfilling both of those needs. The 40-ton DX300LL-3 is an all-purpose machine that picks and places the Olstedts' heaviest timber with a lift capacity of 28,540 pounds over the front of the machine and a swing torque that exceeds 82,000 foot-pounds. The smaller 32-ton DX225LL has a 36-foot reach, a swing speed of more than 11 rpm and a maximum loading height of 42.5 feet.

> *"I feel really good about Doosan and its reliability. We've had no service calls in two years. Their machines are simplistic and smooth to operate."*
>
> — **Dan Olstedt,** operations manager, Olsteadt Logging

Efficient and reliable

Containing operating costs is a big part of the company's game plan, and maintenance is a key expense that has become easier to control with Doosan equipment.

"I feel really good about Doosan and its reliability," Dan adds. "We've had no service calls in two years. Their machines are simplistic and smooth to operate."

Doosan's advanced technologies are providing quicker cycle times, increased torque and measurable fuel efficiency compared to the company's non-Doosan models. During the shovel-logging process, Dan says the Doosan log loaders, on average, are typically burning 6 gallons of fuel per hour.

"With the previous machines, we were burning 8.5 gallons per hour," he says, "and on the landing, we were burning 3.5 gallons per hour with the Doosan and 5.5 gallons an hour with the other machines. It was a $1,400 savings per machine per month on fuel alone. I can make machine payments with that kind of money."

He would be the first to say that not all logging profits grow on trees. **DM**

Visit **www.doosanequipment.com** to read more about Doosan log loader performance, reliability and comfort features.

FROM GENERAL CONTRACTOR TO RECYCLING EXTRAORDINAIRE

With equipment support from a dynamic duo of Doosan excavators and DL250 wheel loader, South Carolina-based Sunshine Recycling has become one of the premier waste processing and recycling facilities in the United States.

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Joe Rich doesn't recall having visited a scrapyard and knew little about the recycling business other than tidbits he'd picked up on industrial jobsites as a general contractor in the construction industry. But that changed in 1996 when Rich was brought in to assist with the demolition and disposal of weigh scales and assorted building materials from a closed and dilapidated meat-packing plant located just outside the Orangeburg, South Carolina, city limits.

That same 60-acre parcel of land is today headquarters of Sunshine Recycling, the business Rich founded — somewhat by happenstance — as a result of his involvement with the packing plant site restoration project. Under his leadership, Sunshine Recycling has grown to become one of the largest and most successful recycling facilities in the United States. The company offers a full spectrum of integrated metals recovery and recycling services — everything from refrigerators to radiators — with assistance from state-of-the-art technology and equipment for reclaiming and/or reprocessing nearly every discarded appliance, construction material and motorized vehicle imaginable.

"I was brought in at the inception to help do some of the demolition work," Rich says. "The plant had been demolished and all the building materials, including metals, were being recycled. The local scrapyard here had recently closed down and this was a great site for a recycling facility. I didn't know anything about recycling metals, but sort of out of necessity, got involved early on and within the first 30 days of operation, found myself running the place."

Never one to back away from a challenge, and with an insatiable appetite for knowledge, Rich has always been eager to learn. And while the environmental recycling component was a natural for him, processing scrap iron was a whole new ballgame. So he set out on a mission to learn metal recycling by visiting mills that purchase non-ferrous metals, spending a day or two at each, working alongside those experienced in evaluating different grades of metal and how to separate and process them.

After immersing himself in research and completing visits to several scrap metal recycling facilities, Rich returned to Orangeburg and secured Sunshine Recycling's first oil-water separator. Now, nearly two decades later, and having long since achieved certification as a National Pollutant Discharge Elimination System (NPDES) and an industrial storm water drain-off facility, the number of oil-water separators on the Sunshine Recycling premises has grown to 12. The recycling facility today ranks among the top of such facilities nationwide.

"Few people are aware that recycling scrap metal is a far more cost-effective solution than producing new metal," Rich says. "In fact, recycling metal is one of the largest of all industries in the world today. When we recycle scrap metal, we're essentially reusing the same materials. The process saves natural resources and is obviously good for the environment."

If not for the equipment …

Although many consider recycling a more recent practice — initiated in large part by the environmental movement of the 1970s — people have been reusing and reprocessing all types of items for centuries. The present-day growth of recycling, however, is more closely tied to the industrial sector. As raw material costs began climbing with the growth and demands of the industrial age, manufacturers started to realize that recycled metals were actually cheaper than producing new — and just as strong. The unsung heroes, working productively, efficiently and yes, more quietly behind the scenes are the many different types of specialized equipment that, according to Rich, have made recycling the competitive industry it is today.

"Manufacturing has a big impact on how much feedstock is available," Rich says, "and with the proliferation of recycling facilities around the world, it's very difficult to be competitive. So the equipment that we use in our recycling operation not only has to be fuel-efficient, but there are also environmental implications. I want to run equipment that doesn't smoke, doesn't pollute and is environmentally friendly."

In 2012, Rich purchased a new Doosan 213-horsepower DX300LC-3 (iT4) crawler excavator from longtime equipment partner H&E Equipment, in nearby Columbia, South Carolina.

Sunshine Recycling purchased a Doosan DL250 wheel loader from H&E Equipment for loading bulk materials like those shown here.

> ***"I consider Doosan to be top-shelf engineering … bringing quality equipment and parts and service together in the same package. That combination allows us to operate more efficiently and cost-effectively in our day-to-day operations."***
>
> — **Joe Rich,** Sunshine Recycling

The new iT4-compliant DX300LC-3 crawler excavator has one of the newest diesel engine packages available for helping achieve non-highway emission standards — in addition to several machine performance and cabin improvements.

"I consider Doosan to be top-shelf engineering … bringing quality equipment and parts and service together in the same package. That combination allows us to operate more efficiently and cost-effectively in our day-to-day operations. Our Doosan DX300LC-3 excavator burns less fuel with fewer emissions. And at the same time, we're assured of receiving quality service from a supportive and responsive dealer for equipment that, when there is an issue, has the resources to repair it correctly and quickly."

The Doosan DX300LC-3 joins a DX225LC crawler excavator and DL250 wheel loader in an expanding list of Doosan equipment purchased by Rich during his partnership with H&E Equipment. According to Rich, Doosan plays an important role in keeping his operation running smoothly and efficiently, and is helping Sunshine Recycling stay a step or two ahead of competitor recycling operations.

"The DX300LC excavator is actually a smaller machine than the other brand of excavator we were using, but because of superior hydraulic engineering and the overall design of Doosan equipment, we get better fuel efficiency from a lighter machine that actually does more work than what we were getting from the other brand's model," Rich says. "So we replaced the other brand and use about 20 percent less fuel."

Ergonomic cabin = operator comfort = enhanced productivity

Rich also understands the critical importance of comfort. The spacious cabin offers excellent all-around visibility, simple controls and high-performance air conditioning and heating. The reclining height- and weight-adjustable standard suspension seat has a headrest and adjustable armrests. An easy-to-read LCD display panel is situated within easy view for monitoring critical machine data and receiving machine warnings. Grab handles and offset steps with slip-resistant surfaces provide easy access to and exit from the cabin.

"The cabin size is bigger with seats that are built better than any machine we've had before," Rich says. "Doosan also put a lot of thought into redesigning the throttle control and air-conditioning system. The cabin is phenomenally quiet, and the cab design makes operator visibility so much better than other models.

"Hands down, there is no doubt cabin ergonomics makes all the difference in the world for productivity. I know this from experience because I'm not just an owner — I'm also an operator with more than 20,000 hours in the seat. You're talking to a guy who knows what it's like to sit in the cab of an excavator for 16 or more hours a day."

All this and versatility, too!

Another feature that drew Rich and Doosan together was the functionality and versatility of the equipment design. Given the many varied tasks required to operate the different facets of Sunshine Recycling efficiently, Rich needs equipment with the ability to multi-task.

"We use Doosan equipment for everything from digging up footers and foundations, knocking over buildings, cutting and processing scrap, stacking and preparing material, to unloading and loading material," Rich says. "There's no doubt, the operational capabilities of our Doosan excavators are only limited by the operator.

"Doosan has also managed to address the maintenance side of things as well," Rich says. "The intuitive design of the onboard system for servicing and maintenance shaves time off maintenance chores. The engine compartment is designed for easy access to most common service points, including the location of the oil drain plugs to position of air filter compartments. Doosan has taken into account every aspect of who's going to touch the machine … operators, service personnel, even owners — the ones paying for it — and have done a great job making us all very happy." DM

DOOSAN HEAVY EQUIPMENT

Excavators / Log Loaders

Crawler | Wheel

Model CRAWLER	Engine hp (kW)	Operating Weight lb. (kg)	Arm Breakout Force lbf. (kg)	Max. Digging Depth ft./in. (mm)	Max. Reach at Grade ft./in. (mm)	Max. Dump Height ft./in. (mm)
DX63-3	59 (44)	13779 (6250)	5765 (2615)	13' 6" (4115)	20' 5" (6230)	14' (4207)
DX85R-3	59 (44)	18960 (8600)	8069 (3660)	15' 6" (4725)	23' 11" (7295)	16' 5" (4995)
DX140LC-3	109 (82)	31746 (14400)	13228 (6000)	20' 2" (6135)	28' (8530)	21' 2" (6440)
DX140LCR-3	109 (82)	33510 (15200)	13228 (6000)	19' 8" (5985)	28' (8530)	23' 3" (7080)
DX180LC-3	125 (93)	41248 (18710)	20503 (9300)	20' 1" (6110)	29' 5" (8960)	21' 4" (6500)
DX225LC-3	167 (124)	49604 (22500)	23810 (10800)	21' 7" (6585)	31' 10" (9710)	22' 5" (6840)
DX225LC-3 SLR	167 (124)	54564 (24750)	13228 (6000)	38' 3" (11650)	50' 1" (15265)	35' 7" (10845)
DX235LCR	173 (129)	53570 (24299)	23810 (10800)	21' 10" (6670)	31' 7" (9627)	26' 1" (7950)
DX255LC-3	185 (138)	56593 (25670)	28219 (12800)	22' 4" (6810)	32' 9" (9995)	23' (7025)
NEW DX300LC-5	271 (202)	68764 (31191)	44092 (19999)	23' 11" (7290)	34' 7" (10541)	23' 10" (7264)
NEW DX300LC-5 SLR	271 (202)	72462 (32868)	23149 (10500)	45' 3" (13792)	57' 1" (17399)	39' 3" (11963)
NEW DX350LC-5	318 (237)	80654 (36580)	57100 (25900)	24' 8" (7518)	35' 11" (10947)	23' 6" (7163)
DX420LC-3	362 (270)	94503 (42866)	43431 (19700)	25' 5" (7740)	37' (11290)	25' 3" (7710)
DX490LC-3	389 (290)	112502 (51030)	50045 (22700)	25' 7" (7790)	38' 11" (11865)	25' 9" (7865)
DX530LC-3	389 (290)	119213 (54074)	56879 (25800)	24' 1" (7340)	37' 7" (11455)	25' 4" (7722)
DX530LC-3 SLR	389 (290)	118013 (53530)	26235 (11900)	49' 7" (15125)	63' 10" (19455)	39' (11890)

Model WHEEL	Engine hp (kW)	Operating Weight lb. (kg)	Arm Breakout Force lbf. (kg)	Max. Digging Depth ft./in. (mm)	Max. Reach at Grade ft./in. (mm)	Max. Dump Height ft./in. (mm)
DX140W-3	137 (102)	33731 (15300)	17902 (8120)	14' 9" (4490)	24' 11" (7585)	19' 5" (5905)
DX190W-3	176 (134)	44092 (20000)	21605 (9800)	18' 9" (5725)	30' 4" (9255)	22' 2" (6765)
DX210W	170 (127)	45761 (20757)	22487 (10200)	20' 6" (6255)	32' 10" (10000)	23' 9" (7250)

Model LOG LOADER	Engine hp (kW)	Operating Weight lb. (kg)	Max. Loading Reach lbf. (kg)	Max. Loading Height ft./in. (mm)	Swing Speed rpm	Draw Bar Pull lbf. (kgf)
DX225LL	155 (115)	65036 (29500)	36' 3" (11049)	42' 5" (12929)	11.7	54013 (24500)
DX300LL-3	213 (152)	80910 (36700)	38' 3" (11650)	44' 7" (13580)	9.9	76611 (34750)

LC = long carriage LCR = long carrier reduced tail swing W = wheel SLR = super-long reach LL = log loader

Material Handlers

	Model	Engine hp (kW)	Operating Weight lb. (kg)	Swing Torque lbf.-ft. (kgf-m)	Drawbar Pull lbf. (kgf)	Max. Loading Reach ft./in. (mm)	Max. Loading Height ft./in. (mm)
NEW	DX210WMH	170 (127)	58202 (26400)	60786 (8404)	26742 (12130)	35' 9" (10900)	39' 8" (12100)
NEW	DX225MH-3	166 (124)	60848 (27600)	60757 (8400)	60715 (27540)	35' 5" (10800)	40' (12200)
NEW	DX300MH-5	271 (202)	79366 (36000)	87787 (12137)	83258 (37765)	42' 8" (13000)	46' 3" (14100)

Wheel Loaders

Model	Engine hp (kW)	Operating Weight lb. (kg)	Bucket Capacity cu. yd. (m^3)	Max. Dump Height ft./in. (mm)	Breakout Force lbf. (kg)
DL200-3	160 (119)	26810 (12160)	2.6 (2)	9' 6" (2890)	22229 (10083)
DL200HL-3	160 (119)	28000 (12270)	2.6 (2)	10' 9" (3270)	22031 (9993)
DL200TC-3	160 (119)	26830 (12170)	2.6 (2)	8' 10" (2685)	23040 (10452)
DL220-3	160 (119)	28350 (12859)	3 (2,3)	9' 3" (2825)	23650 (10727)
DL250-3	172 (128)	31900 (14470)	3.7 (2,8)	9' 2" (2785)	27120 (12308)
DL250HL-3	172 (128)	32780 (14870)	3.4 (2,6)	10' 8" (3250)	25673 (11645)
DL250TC-3	172 (128)	31770 (14410)	3.4 (2,6)	9' (2740)	25980 (11784)
DL300-3	271 (202)	41204 (18690)	4.2 (3,2)	9' 4" (2845)	37993 (17233)
DL300HL-3	271 (202)	41612 (18875)	4.2 (3,2)	11' 2" (3403)	37768 (17131)
DL350-3	271 (202)	43762 (19850)	4.8 (3,7)	10' (3040)	37768 (17131)
DL420-3	354 (264)	50900 (23090)	5.5 (4,2)	10' 1" (3075)	47210 (21414)
DL420HL-3	354 (264)	52030 (23600)	5.5 (4,2)	11' 9" (3585)	45190 (20498)
DL450-3	354 (264)	56527 (25640)	6.3 (4,8)	10' 8" (3240)	51930 (23555)
DL550-3	380 (283)	69655 (31595)	7.5 (5,7)	11' 2" (3405)	58450 (26512)
DL550HL-3	380 (283)	70658 (32050)	7.5 (5,7)	12' 7" (3830)	56877 (25799)

HL = high lift TC = tool carrier

Articulated Dump Trucks

Model	Engine hp (kW)	Operating Weight (empty with tailgate) lb. (kg)	Max. Loaded Weight lb. (kg)	Heaped Capacity (with tailgate) cu. yd. (m^3)	Payload lb. (kg)
DA30	375 (280)	51588 (23400)	113318 (51400)	23.3 (17,8)	61729 (28000)
DA40	500 (368)	70107 (31800)	158292 (71800)	34 (26)	88185 (40000)

Specifications and design are subject to change without notice

DOOSAN VIP GIVEAWAY
CONEXPO-CONAGG 2014 · LAS VEGAS NEVADA

DOOSAN VIP WINNER: JON POLK

Contractor Jon Polk has a lot to celebrate in 2014. Not only is his company — Landworks Earthmoving, Inc. — marking its 20th anniversary, Polk was selected as the winner of the 2014 Doosan VIP contest. The Lebanon, Tennessee, resident was rewarded with a complimentary trip to the 2014 CONEXPO-CON/AGG trade show in Las Vegas, Nevada, in March.

Back in Tennessee, Polk owns and operates two Doosan crawler excavators for his heavy earthmoving and paving company. He purchased the Doosan excavators from Bobcat of Nashville, and is considering a new Doosan wheel loader to help with heavy lifting tasks when he opens a new limestone resale yard and asphalt plant.

"With hard work and using the right equipment, we've grown our business into a heavy earnthmoving and paving company throughout Middle Tennessee," Polk says. "We receive great parts support from our local Doosan dealer, Bobcat of Nashville."

Accompanied by his fiancée, Jessica Pfennig, Jon Polk is pictured with Doosan employees Ron Hadaway, Todd Roeker and Jeremy Holck.

"WIN A ONE-YEAR LEASE" CONTEST WINNER: RYAN DOMRES

Ryan Domres, of Phoenix, Arizona, was selected as the winner of the Doosan "Win a One-Year Lease" contest, and will be awarded with a one-year lease on a Doosan DL250-3 wheel loader.

Domres (pictured left) entered the contest at the CONEXPO-CONAGG trade show in March and his response to "How will a Doosan machine help you deliver more?" was judged to be the best submission. Company officials said Domres' entry was exactly the type of essay and personal story they were looking for.

Domres recently branched off from his family's company — Domres Grading — to start his own recycling business in the Phoenix area. Domres Grading was started in 1972 by Domres' grandfather and has established a reputation of providing quality work for its customers. Using this one-year lease on the DL250-3, Domres plans to apply his family's proven tactics and work ethic for success with his own business.

"Resource Recycling is going to be an innovative company with the desire to use the best equipment and will carry my family's reputation into this new field," Domres wrote in his entry. "I believe this will be a great partnership with Doosan and an excellent way to grow my business."

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OR make it yours and buy a new Doosan machine with low financing!

Lease for as low as **$1,899*/month**

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DX140LC-3 CRAWLER EXCAVATOR

or get **1.9%** financing for 60 months

Lease for as low as **$1,999*/month**

minimal tail swing

DX140LCR-3 CRAWLER EXCAVATOR

or get **1.9%** financing for 60 months

Lease for as low as **$6,799*/month**

DA30-4 ARTICULATED DUMP TRUCK

or get **1.9%** financing for 60 months

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DL250-3 WHEEL LOADER

or get **1.9%** financing for 60 months

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*For a limited time, the 3 Year, 5000 Hour engine/powertrain factory warranty will be available at participating and eligible dealers only. Offer may vary by product type, series, model and select units in dealer inventory. Offers available on new equipment in US and Canada only. Some restrictions apply. Length of contract may vary. Prior purchase not eligible. Lease amount is in US dollars. See dealer for details. Financing provided on approval of credit by authorized Doosan finance providers to well qualified buyers. The rates listed herein do not take into consideration any administrative fees and are subject to change based on the amount of such fees (which may vary). Doosan reserves the right to extend or discontinue any of these programs at any time without prior notice.

Where applicable, price includes the machine and a standard bucket (quick coupler is optional). Photos may show other than standard equipment. See your dealer for additional Targeted PowerLease℠ offers.

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